The AGRICULTURAL EDUCATION Magazine

Feature — Mechanics and a Changing Agriculture

The Agricultural Education Magazine

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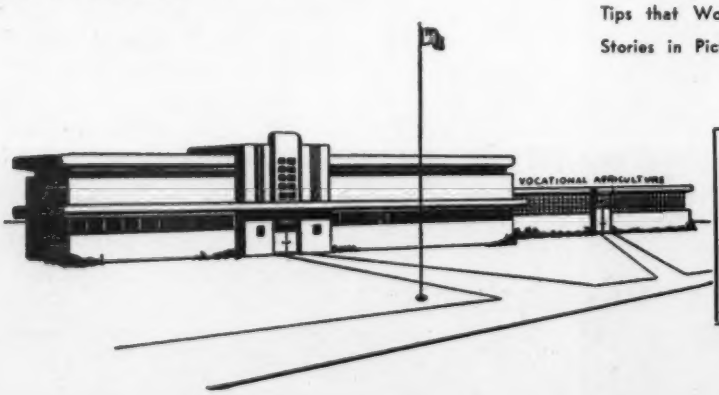

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Editorials

Philosophy and Farm Mechanics

T. W. GANDY, Teacher Education,
Alabama Polytechnic Institute

The title, "Philosophy and Farm Mechanics," may appear to be strange, strange in that the two subjects seem unrelated. Few of us think of philosophy when we refer to the field of farm mechanics, and this is the exact reason for the title. The two fields of thought are related; in fact, no one performs in farm mechanics in the absence of a philosophy.

But why the title? Why at this time, that is? Farm mechanics as a field of thought and action has been growing and changing at such a rapid rate that we seldom refer in our thinking to basic philosophical beliefs to determine what should and should not be done. All too often we simply do the expedient thing; we get more concerned with helping repair a tractor for a farmer than with teaching him to solve problems about that tractor. We get absorbed so much in practical daily teaching and living, particularly when technology seems so important, that we tend to forget why we teach, what goals are truly important, and what ideals and values should be uppermost even in the teaching of farm mechanics.

This is intended to be a challenge to each teacher to think deeply about the reasons why he uses his time in farm mechanics, or in anything else, the way he does. This should not be passive reflection, but active searching for answers and intelligent thinking on the subject of a useful, up-to-date, educational philosophy. In these few sentences it is impossible to outline or even suggest an adequate philosophy for the field of farm mechanics. However, one example of the type of thinking that would be profitable is this: if the democratic goal of promoting maximum discovery and development on the part of each student is good, then the field of farm mechanics taught correctly is one of the best areas in which this goal can be achieved.

This is a mechanical age, full of mechanical gadgets, and man must learn to live with them. He must create them, use them, and service them. In learning to create, use, and service, he may easily lose sight of the need for basic understanding. We cannot hope to teach each student, adolescent or adult, all he needs to know about farm mechanics. Therefore, farm mechanics must be taught as an introduction to the field rather than as a terminal course. The student must be shown the value of a problem-solving approach rather than a simple skills approach. He must be taught the underlying values inherent in the broader concept of

(Continued on page 148)

From the Editor's Desk . . .

Need for farm mechanics instruction remains

Change is inevitable, but the thought of change should not frighten us. Yet some of our co-workers have been frightened by talk about a changing agriculture into saying that the farm shop is a vanishing part of our program. Presumably, the farm shop—and our farm mechanics instructional program—will wither as rapidly as the use of rental machinery and machinery pools increase.

Even if farm machinery rental could have this effect, the widespread use of such arrangements is still a long way off and may actually never become the factor in farming many predict. Many items of farm machinery are far from being so expensive that farmers will not want to own and maintain their own. And, when one wanders over a modern farm, he still gets the impression that there is much of a mechanical nature that farm workers will always have to know. The content and nature of instruction in farm mechanics is constantly changing, but the need for such instruction remains.

Somewhere, somehow, farm boys and men need to learn how to perform the many small maintenance jobs that are forever cropping up around the farm and farm home. Painting, carpentry, electrical wiring, fencing, plumbing, masonry, glazing and a host of other shop learnings help us achieve the objectives of vocational education in agriculture. The understandings needed for doing these jobs well can be a challenge to the most capable student.

Farm machinery and power are one of the wonders of our times, but this equipment is not free from operational defects. Farm workers still need a great deal of mechanical understanding to use this equipment effectively and keep it in operation.

Farm managers, agricultural agencies of various kinds and our agricultural colleges can recommend regarding farm mechanization, but it is still the farm worker who determines whether mechanization of various aspects of farm work will succeed.

And so it goes with all the areas of farm mechanics. Much help has been and will be provided farmers by non-school agencies; some machinery companies may take over adjustment and repair of huge, expensive machines; some parts of machines may be constructed as sealed, self-lubricating units which can be exchanged; and machinery rental may increase. But, the need for a knowledge of farm mechanics, the need for many basic skills, and the need for sound

(Continued on page 148)

Need for - - -

(Continued from page 147)

mechanical judgment will continue.

Instead of wasting time and energy worrying about a vanishing farm shop, we should be studying the ways in which the content and instructional methods can be changed to accomodate changing farmer needs. Especially do we need to increase manyfold the emphasis given to the development of the ability to make sound judgments in the area of farm mechanics. □

Philosophy and - - -

(Continued from page 147)

farm mechanics, and he should be taught to use his talents in discovering new and better ways of doing things. □

The Cover Picture

State President Harry Markos, with ribbons, and Vice-President Paul Conover, of the Utah FFA Association assist in judging the farm mechanics exhibit at the Utah State Fair. Professor Von Jarrett of the Utah State University is seen judging a hay elevator which was one of many large projects entered. □

(Photo by Elvin Downs, State Supervisor, Agr. Ed.)

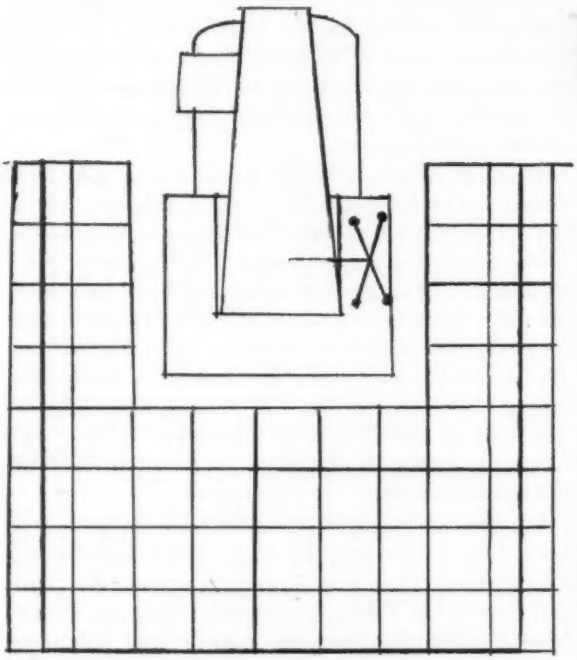


Fig. 1. Data Sheet for Drill Press.

Fig. 2. Arc Welding Work Station showing floor grid and observer. Machine turned off for picture. (Dubuque Telegraph-Herald photo.)

Space Requirements in the Farm Mechanics Laboratory

HARRY D. HENDERSON*

HOW much room should a student have to operate an arc welder? Is a three-foot working lane adequate for repairing farm machinery? How much space should be allowed for traffic aisles in the farm shop? These are typical questions that the vocational agriculture instructor must answer if he is planning to revise or rebuild his facilities to meet, in his teaching program, the challenge of an evolving agriculture.

Harry D. Henderson

Success in farming is demanding an ever-increasing knowledge of the application of science and engineering principles. The rapid technological advances of the past 10 years have brought with them added responsibilities to the instructor. Concurrently, the teacher faces continually increas-

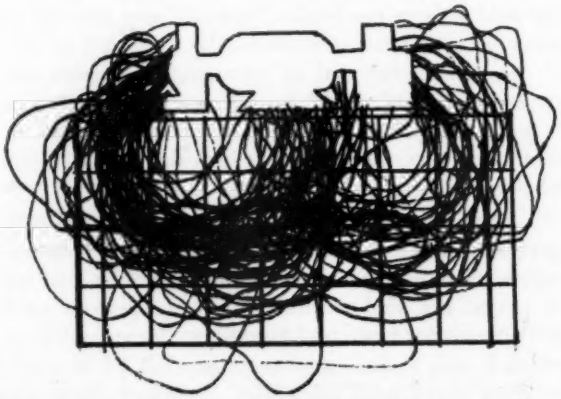


Fig. 3. Composite data sheet for grinder-buffer.

*Dr. Henderson is Professor in charge of Agriculutral Engineering, Department of Agriculture, Wisconsin State College and Institute of Technology, Platteville, Wisconsin.

ing competition for the use of time and space in which to provide adequate learning opportunity for the boys seeking a career in farming or related work. Laboratory periods have been shortened, enrollment per class has been enlarged, and curricula have been expanded.

The absence of space standards for work stations in a farm shop laboratory is rather surprising as well as unfortunate. The recommendations available are usually of a very general nature and are for the total physical plant for vocational agriculture rather than for any specific area or machine. The over-all recommendations are good and very necessary, but when the teacher of agriculture faces his superintendent, school board, or architect, he needs something more specific with which to present evidence of his departmental necessities. The dimensions available are those selected arbitrarily because there has been little or no research on which to base them. Even at the opinion level, however, there are very few actual recommendations as to the areas needed for each work station. This dearth of information has made it difficult for the agriculture teacher to plan the proper allotment of laboratory room for each of the various pieces of power and bulk equipment.

In order to provide positive evidence of space needs in a farm shop laboratory, a study[1] was conducted at the Wisconsin State College, Platteville, in the year 1957-58. Since the dimensions of each machine or work bench are easily obtained either from sales literature or from actual measurement, the study dealt primarily with the operational space needed at the work stations.

Plan of the Study

The population for the space study was comprised of 209 students majoring in agricultural education at the Wisconsin State College, Platteville. The students were members of farm mechanics, farm carpentry, farm machinery, and farm power classes. Body dimensions of the subjects, when compared with those of another study[2] indicated that the students were within the normal range of a large segment of the total (adult) population.

[1] Study for Ph.D. dissertation under direction of Dr. Milo J. Peterson, Professor and Head and Dr. Harry Kitts, Professor, Department of Agricultural Education and Mr. Arthur Schwantes, Professor and Head, Department of Agricultural Engineering, University of Minnesota.

[2] Sahley, Lloyd, Wm., Dimensions of the Human Figure, Cleveland Designers and Consultants, Inc., Cleveland, Ohio, 1957.

The data for the study were obtained from sheets (Fig. 1) which contained scale reproductions of 13 work stations. The work stations were located in the teacher training farm shop at the College. Theoretical standards were established to serve as guides in marking off the operational areas at the various work stations and to facilitate the tabulation of the data.

An instrument was developed in order to measure the space requirements at each work station. A grid system was adopted whereby rows of six-inch squares were taped on the floor in the operating area of a machine or work bench. An observer then recorded the extremities of motion of the operators and their materials on a data sheet which was actually a floor plan of a work station (Fig. 2).

The experimental data were recorded over much of the academic year. Dimensions to the left, to the right, and to the rear at each work station were tabulated. The median, mean, standard deviation, and range were computed for each operating area. Composite data sheets (Fig. 3) which showed the outlines of all space requirements at each station were made. This view of the operating outlines indicated the area(s) of greatest concentration, the total area covered, and the variations among individuals. The dimensional summaries and the composite data sheets were used as the basis for calculating space recommendations.

The machinery repair station was investigated further. The space occupied by a farm machine was found to correlate closely with the space used by a three-foot lane on four sides of the machine; thus the thumb rule—space for a machinery work station equals twice the space for the machine—was formulated.

Findings and Conclusions

The various work stations in the farm shop have three functions:

1. To provide a suitable facility at which the student may develop competency in the phases of mechanized agriculture.
2. To provide a place where the instructor may demonstrate the skills and techniques necessary for such competency.
3. To provide an area in which projects, machines, and equipment may be serviced.

Space recommendations for the 13 work stations in the study are shown in Table I.

Table I. Recommended Dimensions for Operational Areas

Work Station	Minimum (inches) Side-to-side	Depth	Optimum (inches) Side-to-side	Depth
Arc Welder	60	30	72	36
Bench and vice	52	27	72	36
Drill press	48	24	60	27
Forge and anvil	64	60	80	72
Grinder-buffer	60	24	80	30
Jointer	200	24	384	30
Machinery repair	2(area of machine)		2(area of machine)	
Oxyacetylene welder	64	30	84	30
Radial saw	240	40	384	48
Round table	48	20	60	24
Soldering bench	60	30	72	36
Table saw	96	288	144	384
Tool grinder	48	24	60	28

The minimum standards might be used economically when shop space is limited or in cases where the number of students per class is small. The optimum standards might better apply when adequate space is available, when the number of students per class is large, or when several classes are forced to meet in the farm shop laboratory during the same school term.

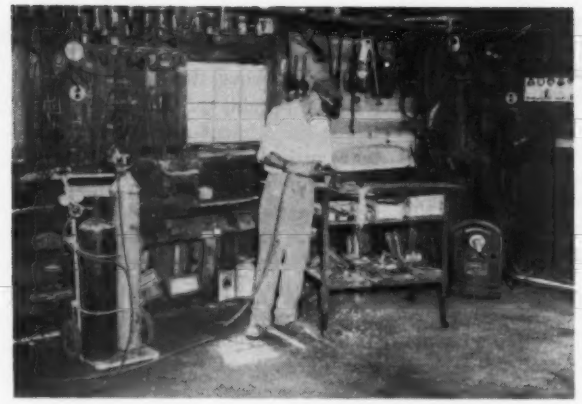
In summary, the study indicated that the space requirements at a work station depend on the following factors:

1. The type of activity performed at the station.
2. The size of the material on which the work is performed.
3. The anatomical dimensions of the worker.
4. The working habits of the individual.
5. The number of people using a station at one time.
6. The direction of movement (horizontal or vertical) of the working part of a machine. □

To all, a—

Happy New Year!

the Magazine Staff



Planning and developing a home farm shop is a part of the instructional program.

Large projects, like the portable feed rack above, should be constructed on the farm, rather than consuming large amounts of classroom time.

Now is the time for - - -

A New Look at Agricultural Mechanics Instruction

C. W. HILL, Teacher Education, Cornell University

C. W. Hill

WE are a product of our experiences. What have been our experiences in agricultural mechanics? What principles give us direction in agricultural mechanics? This varies from school to school and state to state because leaders in agricultural education have held different beliefs. Do we have a philosophy that meets the needs in agricultural mechanics today? During World War II, we conducted farm machinery repair programs. Also, certain items of equipment not available for purchase were constructed. It was the practice at the time to provide the facilities and the instruction at the school so that farmers and boys could repair and construct farm machines or equipment. There was teaching and learning taking place, but it was of secondary importance. The emphasis was to complete the project and get it out of the shop. What is our primary aim today? Are we still primarily concerned with the repair, servicing, and construction of projects and equipment?

It is my thesis that the work in agricultural mechanics should be guided by the same principles and objectives as the other instruction in vocational agriculture. Agricultural mechanics is a part of the instructional program. Therefore, the pupils and farmers need to learn and develop the abilities required to successfully operate a farm. Many of the abilities may be used by pupils going into occupations related to farming in which farmers call upon others for services. A farmer must be able to operate, service, and repair farm power and equipment units; to use electricity efficiently; to plan, provide, and maintain farm buildings and conveniences, etc. Many abilities are required in making these managerial decisions and in performing operative jobs. It should be the primary aim to develop in pupils and farmers the ability to perform the jobs they do daily, weekly, monthly, or yearly rather than giving primary emphasis to repair or production of projects. The ability *to do* is the end product rather than the completed job or project.

A principle we subscribe to is learning to do by doing. For the agricultural production jobs, we teach the job in the classroom and/or on the farm. The pupil develops a plan and puts it into practice on the home farm. Individual follow-up instruction is given by the teacher or the parent. Have we followed this practice in agricultural mechanics? Some teachers have done it while others have not. We tend to have the pupils do far more work in the agricultural mechanics shop than on the farms at home.

It is assumed that farmers are required to have abilities in agricultural mechanics. They perform jobs requiring these abilities. Therefore, the opportunity exists on the farm for boys to learn and to do these jobs. These jobs naturally become a part of the farming programs of the individuals. The jobs pupils have in their farming programs are taught through group instruction with individual follow-up by the teacher or parent on the home farm. Why cannot this same practice apply to agricultural mechanics instruction for many of the jobs boys need to learn?

To implement the above concepts, two points need continued emphasis and development. First, the planning for and development of the home farm shop. This has been a part of the instructional program. Continued and increased emphasis will result in improved home farm shop facilities. Once the facilities are available, then pupils will have more opportunity to learn and to do agricultural mechanics work at home. Second, some changes in the course of study and methods of teaching would make it possible for pupils and farmers to do more on the farm. It is strongly suggested that the skills be taught at school and the pupils do more of the repair and construction work at home. It is granted, boys will need practice at school in learning the skills by doing. The question to consider is, can the pupil spend twenty or thirty periods in profitable learning by constructing a range feed rack? Might not the time be used to teach the skills and help the pupil develop the plan for the project? Then, let him do more of the work at home. This

should make available more periods to teach additional managerial and operative jobs. As an example, many of the jobs in the operation, servicing, and repairing of farm engines and field machinery can be taught in group instruction with pupil practice. Then, the pupils can go home to further develop the ability and perform the operation with the machines. This is equally true in other areas of agricultural mechanics. Teachers will need to provide more individual follow-up instruction on the farm and in the classroom if such a program is to succeed. Parents must also be educated to provide more opportunities and to give more individual instruction.

In summary, the instructional program in agricultural mechanics should place primary emphasis upon the developments of abilities needed by successful farm operators. The supervised farming program has been established as a method of teaching in agriculture. Agricultural mechanics jobs can and should be in the pupils' supervised farming programs. Skills can be taught with some practice at school. But, more emphasis should be placed upon the pupil doing more practice, performing the job, or repairing the machinery on the home farm. With less time being used for construction and repair in class, additional jobs can be taught. Thus, the agricultural mechanics instruction can be expanded and improved. □

A close look at - - -

Farm Mechanics in a Changing Agriculture

L. E. STONE, Vo-Ag Instructor, Mt. Pleasant, Texas

Thirty-one years ago, a most remarkable model "A" automobile was made in Detroit. It captivated the American people. This automobile was a tough, high wheeled, and long-legged car possessing many of the virtues and a few of the vices of the model "T" it replaced. The simple mechanism of the model "A" made it possible for any shade tree mechanic to repair it with only a knuckle-busting wrench, a pair of pliers, and an adequate supply of baling wire. The simplicity and economy of operation caused it to be sold by the millions. But, impossible as it seems, within a period of twelve years the model "A" became obsolete. Times, roads, and economic conditions changed. The vehicle belonged to yesterday—the good old days.

The antiquation of this automobile did not deny the American people a means of transportation. Such antiquation merely resulted in changed cars. The importance of the automobile was not decreased.

Changes such as have occurred in the automobile industry have been and are occurring in the field of education—especially in the field of agricultural education. High school vocational agriculture programs are in the midst of a changing situation. To meet these new demands and to keep abreast of the times, it has become necessary to reorganize and change the agricultural education programs.

It is true that change and progress sweep away many good and cherished things. We may deplore the change from an agrarian economy to an industrial economy, such as we are now experiencing, but we cannot stop it.

Let us take a look at some of the agricultural changes that are occurring in the United States that are affecting our agricultural industry and our high school vocational agriculture programs.

Changes in Agriculture

1. Population changes. Our rural population is declining. Only 13 percent of the nation's population is needed to produce the food and fiber needed for the remaining 87 percent of the population. It has been predicted that in the very near future only 5 percent of the population will be required to produce the food and fiber for the remaining population.
2. Industrial changes. Most of the nations of the world are highly industrialized and are becoming more so as the years come and go. Industry will continue to attract large numbers of our rural youths and adults. Of the nation's 5 million farmers, many thousands of them have annual incomes of less than $1,000. These people cannot and will not stay on farms. Politically, we have abandoned the idea of helping them remain "Down on the Farm." Educationally, we can assist them to make the transition from rural to urban living.
3. Changes in farm sizes. The number of large size farms and small size farms in the United States is increasing. Because of various economic reasons, it has become necessary for full-time farmers to increase the size of their farms in order to have an economical farming unit. Too, because of the increasing number of part-time farmers, the number of small size farms has increased. The number of small size farms will no doubt increase as we become more highly industrialized. Many people employed in industry maintain a small part-time farming operation in order to supplement their income and to maintain a rural-urban type of living.
4. Production changes. Automation is just around the corner for agriculture. Mechanization has enabled agriculture to crowd 200 years of progress into the last ten years. Such progress has resulted in an increased amount of leisure time for rural people. We have not learned how to use wisely our leisure time as yet. For example, we have literally hundreds of thousands of teen-agers on farms and in cities with nothing to gainfully occupy their time.
5. Changes in behavior of youth. As a result of many social-economic changes, we have a distressed and confused generation of youth. J. Edgar Hoover states that "teen-age crime is the most pressing problem in America today." According to E. V. Walton, head of the Department of Agricultural Education at Texas A & M, juvenile delinquency increased 36 percent in 1956 in the United States.

Rural or small town juvenile delinquency increased 58 percent during the same period. Rural youth may not be as "mean" as their city cousins, but the frequency of rural delinquency is almost twice that of city delinquency. Such an increase in delinquency among rural youth is probably due to their mobility, i.e., the ease with which they can get from one place to another. Too, they read and are influenced by newspapers, radios, and television. If an epidemic

of vandalism occurs in Chicago on Saturday, it can, because of modern communication media, become common talk in Texas or Georgia by Monday.

This quick look around the corner of tomorrow calls for a bold new look at our educational program in vocational agriculture and an examination of the ways in which the program has kept pace with the agricultural changes that have occurred. We should also look at the program and examine the means by which the program proposes to cope with conditions that are expected to arise in the future.

Mechanical Skills Needed

As our nation becomes more highly mechanized, there is an ever increasing need for people to learn mechanical skills. Realizing this, the Mt. Pleasant High School vocational agriculture department is increasing emphasis on farm mechanics. In farm mechanics, such things are taught as farm welding, shop, rural electrification, farm buildings, minor tractor repairs, and tractor maintenance.

Instruction in farm mechanics affords many advantages to the student. In addition to learning the knowledge, skills, and ideals needed by present and future farmers, he learns how to intelligently handle the managerial problems connected with selecting, purchasing, and maintaining farm machinery, electrical equipment, and household appliances.

This learning, in addition to being applied on the farm, can also be applied to many nonfarm situations. For example, the person who is serving as farm representative for an electrical power company must have a basic understanding of the use of electricity. Therefore, the high school student who learns about electricity can apply this same learning not only to farming but to other occupations as well.

Instruction in farm mechanics also gives students an opportunity to do purposeful thinking, as well as to use their hands, dealing with common problems of everyday living. Such instruction prepares the student for present and future problem solving where mechanics is involved.

Approximately 40 percent of the student's time in vocational agriculture at Mt. Pleasant High School is spent working in farm mechanics. The major problems have been enumerated above.

What should be taught in farm mechanics and how much time to be spent in the various areas of instruction have been topics of discussion for several years. I am sure that all of us will have our own ideas on this subject. One will, of necessity, need to adjust the time element to his own local situation. Available shop facilities and differences in local conditions make it necessary for the Vo-Ag teacher to make adjustments in any recommendation so it will fit his local community.

A Farm Mechanics Program

The following chart is taken from material that came out of a workshop of vocational agriculture teachers in Texas during the winter of 1958-59. The hours were only for teaching theory and for building the necessary

Class and Hours			*Enterprises and Jobs*
VA I	VA II	VA III	
3			Reading plans—simple blueprint reading and sketching.
12			Woodworking:
			A. Hand tools — saw, hammer, plane, chisel, augur, square. Also projects that will involve using these tools.
3	7	4	B. Power tools — saw, jointer, band saw, jig saw, sander, and planer.
2	1	1	Paints and painting—selecting, spraying, brush application, care of brushes and sprayer, preparing surfaces, storing and handling.
3	3		Lumber and bill of materials—selecting, grades, use.
1	1		Builders hardware—selecting and using.
	5	5	Farm buildings—types, uses, economy, common types of construction, fencing, and gates.
4	12		Metal work—hand and power tools, drilling, threading, tapping, hack-sawing, riveting, and layout.
4	16	10	Welding:
			A. Arc—types of welders, safety, electrodes, preparation of work, types of welds, welding.
	6	4	B. Acetylene—safety, terms, equipment, rods, cutting, closing and storing rig.
2	2		Soldering—selecting equipment, tinning, cleaning, fluxes, and applying solder.
	4	4	Concrete — uses, ingredients, mixing, finishing, curing, forms for concrete, and safety.
3	5	8	Farm electrification—economic importance, terms, safety, wiring, proper fusing, and motor choice, protection and maintenance.
		20	Farm machinery—economics of farm machinery, principles of engine, operation, and engine maintenance.
3	4		Leather and rope work—uses and useful knots of rope, care and storage, and rope and leather halters.
		8	Plumbing—water systems, sewage disposal, maintenance of plumbing system. (Includes cutting, threading pipe, and simple plumbing repairs.)
40	66	64	Totals.

projects to cover the skills. Additional hours would be necessary for individual projects. This is a three-year program.

You may not agree with any of these suggestions, but one thing is sure, we must change with the times. If we do not change our programs of vocational agriculture to fit the times, we are doomed as a program. In any 35 years of public education, I have watched the tide change from ox power to atom power. More and more of us will do less and less, so let us learn to do it with all the grace that is in us. Vocational agriculture as I knew it is gone. I believe it is time to change the 1917 philosophy of vocational education in agriculture. □

Farm Machinery Workshop

Helps teachers keep up-to-date

LEWIS EGGENBERGER, Vo-Ag Instructor, Winfield, Kansas

Lewis Eggenberger

ARE we progressing with the changing times in our teaching of farm mechanics? Let's take a minute and think about this question. We know that farmers are increasing their use of mechanized equipment on the farm to decrease their labor cost. Farmers are purchasing new farm equipment costing as much as $8,000 with an average investment in farm machinery in the United States in 1958 of $3,200 per farm, compared with $1,753 in 1950, and $394 in 1940. What are we doing to teach our all day students, young farmers, and adult farmers to recognize the need for properly servicing, adjusting, and maintaining this $5,000 tractor or $1,300 mower-haycrusher; and to develop in them the desire and ability to perform the unspecialized maintenance jobs before they become emergencies?

In the summer of 1958, Kansas took another step forward in answering this problem. The State Department of Agricultural Education selected thirteen vocational agriculture teachers to attend a farm machinery workshop at Kansas State University in June of 1958. The instructor and consultant for this course was Mr. A. H. Hollenberg, Specialist in Agricultural Education (Farm Mechanics) of the Agricultural Education Service, Office of Education. The host instructors were Professor P. N. Stevenson and Professor C. O. Jacobs, Agricultural Engineering Farm Mechanics Instructors at Kansas State.

The two machines studied at this school were the forage harvester and the combine. Used machines were available for the students (vocational agriculture teachers) to inspect, repair, adjust, and service. Mr. Hollenberg had us work on a unit of the machine with the aid of the instruction manual; then we went to the classroom and answered and discussed the questions in the student manual written by him and Mr. E. J. Johnson. The questions were answered by use of reference material and discussion of the problem among the students. The machines were field tested when we completed the maintenance work. Can you think of a better follow-up for the student? It is certainly better than a written test.

Professor P. N. Stevenson pointing to a defective part from the Model 21, 14 foot self propelled Massey-Harris combine. Identification from left to right—David V. Rector, Clearwater High School, Vo-Ag Teacher; Powell Heide, Pretty Prairie High School, Vo-Ag Teacher; Paul Oltmanns, Moundridge High School, Vo-Ag Teacher; Lewis Eggenberger, Winfield High School, Vo-Ag Teacher; Glen Schulthess, Haven High School, Vo-Ag Teacher; James J. Stanley, Cheney High School, Vo-Ag Teacher; Duane McCune, Dickinson County Community High School, Vo-Ag Teacher; P. N. Stevenson, Kansas State University, Farm Mechanics Teacher Trainer; Ray L. Smith, Howard High School, Vo-Ag Teacher; Frank Carpenter, State Department of Agricultural Education, Asst. Supervisor; Richard L. Ramsdale, McPherson High School, Vo-Ag Teacher; Francis Shoup, Mulvane High School, Vo-Ag Teacher

The State Department of Agricultural Education, under the supervision of the State Supervisor, Mr. C. C. Eustace, did not let the ball stop rolling with the completion of this workshop. They cooperated with the Kansas State University Agricultural Engineering Department in scheduling twelve training centers throughout the State of Kansas so all the vocational agriculture teachers would have an opportunity to receive training in farm machinery maintenance. These centers were the high school farm mechanics shops of the vocational agriculture teachers who had attended the original workshop. Scheduling these schools was accomplished in order that Professor Stevenson or Professor Jacobs could work with the host instructor during the months of June and July, 1959.

An added incentive for the instructors was the opportunity of earning two hours of graduate credit. This was arranged through the cooperation of the State Department of Agricultural Education, and the Agricultural Engineering Department and the Department of Continuing Education at Kansas State University.

These training centers were organized to familiarize teachers with the methods of teaching farm machinery maintenance to high school vocational agriculture students. Of course, only one type of machine was used at each center. Participating vocational agriculture teachers had a choice of the combine, forage harvester, or baler. Those developing this course hope that the teachers will be able to adapt these methods to maintenance of other farm machinery, except for some special skills to perform a specific job related to a certain machine.

Instruction on the individual machines was similar at these centers to that used by Mr. Hollenberg. In addition, Professors Stevenson and Jacobs, with the aid of their college classes, developed a maintenance check list for the major farm machines. These check lists were used by the students before they started to work on each unit of the machine.

They entered the condition of each defective part, its number and cost, and how it was corrected (replaced, straightened, welded, etc.). These check lists were excellent, for the student knew what parts were good or bad on the entire unit before beginning repairs.

Powell Heide, Pretty Prairie High School, foreground; and James J. Stanley, Cheney High School, checking the wheel bearings on a combine.

All instruction at these centers was directed toward what procedure the individual teacher was going to use in his community to teach farm machinery maintenance.

To complete the course, all teachers will submit the check sheets from their high school students who inspected, repaired, and serviced three machines of three different types. In other words, there could be three mowers, three balers, and three plows. In addition, the teachers will submit a consolidated summary of the machines. This includes machine name, make, model, year, estimated value of repairs, cost of replacement parts, and estimated value of repaired machine. These consolidated summaries will be used in writing a publication on farm machinery maintenance.

One thing that was apparent at the twelve training centers was the need for teaching farm machinery maintenance. All the machines the farmers furnished for these schools, even the newer machines, needed adjusting and repairing. A major break-down was prevented on a 1957 combine at the Winfield school by replacing a worn key in the pitman drive. Also it was determined that the chain that drove the reel was replaced with the incorrect number chain. A 1949 self propelled combine that was serviced, adjusted and repaired at a cost of approximately $90.00 combined two hundred and fifty acres of wheat without a breakdown.

Professor Stevenson predicts that the eighty-eight teachers who attended these centers will give more emphasis to farm machinery maintenance in the future.

Ray L. Smith repairing the sickle, reel and auger drive on a 14 foot self-propelled combine.

Supervisors, teacher trainers, and vocational agriculture teachers must not let our students down. Let's keep the machines rolling. □

Team effort required for - - -

Good Public Relations

L. F. CRABBE, Supervision, Ohio

This is the day of relations. Not necessarily the kind that used to drop in for Sunday dinner, but important ones nevertheless. The word "public relations" is beginning to sound trite but even words such as "informing the public" and "public information" do not quite carry the meaning and stress the importance of the job needing to be done.

To improve vocational agriculture's public relations on a local, state or national basis, we need to answer the question, "What segment of the public do we wish to inform?" The answer seems to be that the number one group would be the parents of our present and prospective high school vocational agriculture students. Second would be local school and community, and third, the remaining members of the general public not previously included.

The vocational agriculture teacher in his local community is in an enviable position to do an outstanding job of public and community relations. These ways and means are generally assumed to be essential:

1. Through effective classroom teaching
2. By well planned on-the-farm teaching
3. Through timely stories to newspapers
4. Through human interest stories on radio and T.V.
5. In promoting public appearances of well prepared students

Vocational agriculture teachers have two top quality picture subjects at their disposal most of the time; boys and animals. Teachers usually know what their news will be before it happens.

We plan our teaching; let's plan our public relations. It requires a team—state staff, teachers, and the chapter reporters. If we don't work together, we'll be like the little Duke who sprang on his horse and rode off in all directions.

What are people reading about vocational agriculture? A clipping service helps furnish the answer to the public relations committee of the Ohio Vocational Agriculture Teachers Association.

In Ohio, we are planning a cooperative attack on the problems. We have a committee made up of teachers, teacher trainers, and supervisors to plan an annual program of public relations. We have recently subscribed to a clipping service. We want to know what we are now getting into newspapers as a means of evaluating our efforts.

As a part of our plan, we are preparing press releases, fill-in type news releases for teacher use and special releases and stories for selected newspapers of the state.

Although we assign staff responsibility for certain functions, we recognize that teachers are the key resources in developing a public relations program in vocational agriculture. □

Teaching Service and Maintenance of Motors

By use of two- and four-stroke cycle engines

GORDON STRUBLE, Vo-Ag Instructor, Temperance, Mich.

High school students are interested in work with small motors

Teaching the principles of operation of the internal combustion engine is an important area of instruction in a high school farm shop program. Knowledge of the working principles and skills in working with engines must be developed for a better understanding of the maintenance and service requirements.

Instruction in the area of engine mechanics in farm shop has in the past presented a problem to instructors in our region. This year, however, we feel confident we can do a better job in this phase of farm shop instruction. The reason for this change came as a direct result of a recent in-service teacher training meeting.

In-service training meetings presented to teachers in the field by Michigan State University provide valuable and timely information. They are presented to the teachers by staff members from the department of teacher education and extension specialists. The meetings are held at a regional level and therefore are presented to each region in the state as a noncredit activity. The technical information presented at these meetings is selected by the teachers in a given region, and it will vary with each region depending upon the interests of the teachers. Each region holds four or more meetings each year. These meetings serve to inform teachers of up-to-date technical developments and skills in agriculture.

At our last in-service meeting, the two- and four-stroke cycle engine was the topic for study. Each teacher was instructed, prior to the meeting, to bring a small engine and the tools necessary for working with the engine. This phase of the program is essential, for we "learn by doing" and must have the materials to work with for efficient training. A two-hour discussion of the importance of the small engine and its position in the economics of the farm program was presented in the classroom. Items included for discussion were as follows:

1. Engine types and design
2. Principles of two- and four-stroke cycle engines
3. Functions of systems
   a. Fuel and air intake
   b. Cooling
   c. Lubrication
   d. Ignition
4. Maintenance
   a. Adjustments
   b. Parts inspection
   c. Care
   d. Storage
5. Fuels
   a. Fuel selection based upon performance
   b. Gasoline and oil mixtures
   c. Factory recommendations
   d. Oils—types and service classifications

The class moved into the farm shop for the second half of the program, and here we were instructed in the procedure to follow in servicing the engines.

The program was readily accepted by the teachers and it has been carried back into their local programs of farm mechanics. This instruction based on the study of small two- and four-stroke cycle engines is adapted to farm mechanics units on the study of internal combustion engines. Small engines are typical of the type the farmer may service to a greater extent than the larger engines which often require the use of a specialist or trained mechanic. It also will serve an additional function in teaching skills in servicing small engines commonly used on the farm and in the farm home. Chain saws, engines on pumps, elevators, lawn mowers, and generators are found in increasing numbers on modern farms. Servicing of these engines can be done by the farmer.

Many farm shop instructors face the problem of limited space for working on engines. This problem is complicated if the engines used are large such as tractor and truck engines. When small engines are used in place of the larger engines, the space problem is lessened. The instruction is also on a "doing level." Small engines are found in large numbers in rural areas and are readily available for use by the students. The numbers and kinds of tools needed for working on these small engines are also readily available in most farm shops. Availability of tools needed for working on large engines often present a problem, especially if large numbers of students are involved.

The objectives of a unit dealing with motor mechanics can be met by the use of small engines. Some specific objectives met by use of the small two- and four-stroke cycle engines are:

1. To develop an understanding of the functions and principles of engine mechanics.
2. To develop skills necessary for operating and servicing small engines.
3. To develop the ability to select an engine best suited for a specific job.
4. To develop an appreciation for an engine and its values to the farmer.

Instruction dealing with servicing and maintenance of small engines can be incorporated with the unit dealing with motor mechanics. Farm shop students are very interested in working with small engines, and this interest aids motivation. Each student will

participate in the study of the small engine and preferably will service his individual engine.

The teachers in our region have used the information and techniques gained at this meeting in their local programs and are pleased with the results. They pattern their instruction after the outline presented at the in-service meeting. The subject matter is treated according to the interest of the students with respect to time devoted to the study of small engines. The usual pattern of instruction starts with classroom discussion of small engines and their use and importance and then leads to a demonstration of the principles of operation. The instruction manual is useful at this point to serve as a guide in servicing the small engine.

Following the classroom instruction, the students move to the farm shop to work on the small engines and put into practice the procedures recommended. The results of a well planned program "pay off" in increased interest in farm shop, numbers of farm shop projects, and publicity for the farm shop program. □

If it's an idea for a department-owned group project you're searching for, consider the 3-fold value derived from—

Growing Broilers on the Contract Basis

—These are the conclusions reached by the teachers of vocational agriculture at Winnsboro, Texas, after growing broilers for seven years.

ZENO E. BAILEY, Teacher Education, East Texas State College

Zeno E. Bailey

MANY changes are taking place on the farm today that have far-reaching implications for the teaching of vocational agriculture. Such changes as reduction in cotton acreage, wheat and other small grain restrictions, conservation reserve program—to name only a few—are creating conditions making it mandatory that the small farmer look to other enterprises as supplemental sources of farm income. Assisting farmers in selecting and analyzing new enterprises that are suitable for their particular farming situation is a vital role which the teacher of vocational agriculture can and should play.

To meet this challenge in the Winnsboro, Texas, Community, the first step taken by the teachers of vocational agriculture was to organize an advisory council for their department. Their thinking was that the advisory council could serve the following two-fold purpose: (1) assist them in planning and carrying out a program of work that would more nearly meet the needs of the school and the community; and (2) assist the department in selling the whole school program to the community. In 1952, the council was officially organized.

During the first year the council was in operation, fifteen meetings of farmers were held for the purpose of discussing the feasibility of broiler production as a supplementary source of income. By the end of 1953, farmers had put into operation thirty-three broiler houses; and by 1958, more than one hundred farmers were producer-members of the Winnsboro Broiler Growers Association. During the years when the association was getting established, the Winnsboro Department of Vocational Agriculture was operating, as a chapter project on the school campus, a 3,000-capacity broiler operation. For four of the seven years of continuous operation, the department has earned an average profit of more than $200 per brood. In expressing their sentiments of the merits of the project, the Winnsboro teachers are fully convinced that broiler production is fitting splendidly into the vocational agriculture program as well as on the various farms in the community. Following an extensive study of the broiler program conducted by the vocational agriculture department at Winnsboro, Leroy E. Joyner[1] sums up the teachers' sentiments regarding the merits of the enterprise as follows: The broiler operation provides (1) an excellent teaching device to augment classroom instruction; (2) a ready source of income to finance a comprehensive FFA program of work; and (3) facilities for several town boys to carry out a supervised farming program.

Considering these three-fold benefits realized by the teachers at Winnsboro through their poultry enterprise, it would seem to the writer that broiler production or some other enterprise by contractural arrangement might have equal application to many communities across the nation. To those of you who might be considering the production of broilers or some similar enterprise on the contract basis, a review of Joyner's study of integrated broiler producers in the Winnsboro area should be of material assistance.

[1]Leroy E. Joyner, *An Analysis of Integrated Broiler Production in the Winnsboro Area*, Master's Thesis, Department of Agricultural Education, East Texas State College, 1958.

The Study

This study was undertaken for the primary purpose of analyzing the broiler-growing operation in the Winnsboro area in order to determine whether or not contract broiler growing or some other type of contract farming could be adapted to the Edgewood community—a community situated some thirty miles southwest of the Winnsboro community. A secondary purpose of the study was to establish a pattern for studying other phases of contract farming. The data were obtained through personal interviews and records kept on the enterprise.

Background of the Study

As has been mentioned previously, the idea of developing the broiler enterprise was conceived through meetings and discussions of the advisory council in 1952. During the early years of the development of the enterprise, the production of broilers represented varied combinations and degrees of integration. No doubt this was due largely to the widely diversified sources of financing used by different farmers in their own operation. Today the contractual arrangement is not completely uniform, but a local feed-dealer supplier who works closely with the association services a fairly large percentage of the growers. There is no extreme "vertical integration" in the Winnsboro area as is practiced in some areas of the United States where one management hatches chicks, provides feed and other supplies, grows broilers, acts as a processor, and makes final marketing arrangements.

The most common practice in the Winnsboro area is for the grower and the feed-dealer supplier to enter into a contract which specifies the responsibilities each party is to assume. In this case, the farmer provides housing

and the labor for routine feeding and watering and is allowed to use the manure on his own farm. On the other hand, the feed-dealer supplier agrees to do the following:

1. Put litter into the house and also disinfect house.
2. Buy chicks and put them into the house, and do the debeaking and vaccinating.
3. Insure chicks against insurable losses such as storms, fire, and death from suffocation caused by pile up.
4. Furnish feed, medication, and sanitation.
5. Finance houses in some cases; supply supervision and management if needed.
6. Furnish a market and pay one cent above East Texas Broiler Market quotation.
7. Provide labor to catch broilers and haul broilers to Tyler, Texas.
8. Charge no interest; arrange brood dates for orderly marketing.
9. Pay the grower the profit earned when broilers are sold.

Limitations of the Study

1. Although the study included thirty-eight broiler growers, this number represents only about one-third of the Winnsboro growers today.

2. The study was confined primarily to the records of one year of operation, 1955. However, the records of one grower (Department of Vocational Agriculture covering a seven-year period of operation were analyzed since their authenticity was of importance.

Findings

The records which covered a one-year period of operation of thirty-eight broiler growers in the Winnsboro Broiler Growers Association presented a rather complete picture of the operations and profits of a relatively new integrated industry there. Both small and large operators represented both new and established growers. During 1955, 407,332 broilers were marketed through the association. The findings which follow seem quite significant:

1. Average profit for each of the thirty-eight Winnsboro growers was $2,088.92 for the year studied.
2. Feed conversion ratio had been improved almost 100 per cent as the industry has developed. In 1952, the Winnsboro Vocational Agriculture Department produced 23.81 pounds of live market birds for each 100 pounds of feed consumed. But by 1958, 40.10 pounds of live market birds were being produced for each 100 pounds of feed consumed.
3. Major factors affecting profits were:
   a. Number of broods marketed annually
   b. Time of year broilers were sold
   c. Mortality rates
   d. Feed conversion ratios.
4. Most growers attempt to market a near three-pound bird.
5. The vocational agriculture department grows broilers on a practical farm scale, in 3,000-capacity broods. Projects are used as instruction in broiler production as well as to provide supervised farming facilities for a limited number of town boys.

Conclusions

1. As profit per bird decreases, trend is to increase scope. Average size brood now in Texas is 8,000 chicks.
2. It is advisable to market more than 5,000 birds annually, as all growers earning more than $1,000 profit sold more than that number.
3. Size of brood has little influence on per cent of mortality—six of the ten high producers held mortality below one per cent, while only two of the ten low producers were below one per cent mortality.
4. The number of broods marketed annually seems to be a significant factor in determining profit. The ten high producers averaged marketing 3.3 broods per year.
5. Broiler producers must watch marketing dates. There was a tendency for prices to be high in March, April, and May; while low prices occurred in October, November, and December, the traditional turkey months. Good management, better bred chicks, and special rations have lowered marketing age to near 56 days.
6. Value of manure should be included in profit computations.

Summary and Implications for Teaching Vocational Agriculture

The poultry industry, being one of the first to adapt itself to production on an integrated basis, has gone farther in this direction than has any other livestock enterprise. According to Robert C. Kramer,[2] Michigan State University Professor of Agricultural Economics, 90 per cent of all broilers produced in the United States are produced under some kind of feed contract. Since this percentage so vividly portrays the present as well as the anticipated future trend in poultry production, it behooves us as teachers to investigate and analyze all possible combinations of contract production before attempting to initiate any community changes. In view of the service rendered farmers through the advisory council organized by the teachers of vocational agriculture at Winnsboro, it would seem advisable that other teachers might want to study their particular approach. By following this or some such similar approach, providing a community representative body is organized, the teacher could rest with greater assurance that most of the community's interest groups would be included. Assuming this to be the case, it then stands to reason that any projects or enterprises which such an organization might decide to introduce would stand far better chances of being accepted by the community and then be carried through to satisfactory completion.

When properly organized and managed, the department-owned broiler project can benefit the vocational agricultural program in the following ways: (1) Serve as an excellent teaching device to augment classroom instruction; (2) provide a ready source of income to finance a comprehensive FFA program of work; and (3) provide facilities for a limited number of town boys to carry out a supervised farming program.

With your broiler project located near the classroom, your instruction in poultry production can now become *vocational* in its truest sense. For it is here that the broiler project becomes a laboratory whereby direct application can be made to what has been studied while in the classroom.

To carry out a well-balanced and challenging FFA program of work your chapter must have money. Under careful operation and management, the income derived from your project enterprise can provide adequate funds for your FFA program of work.

Assisting town boys in locating facilities which will enable them to carry out a supervised farming program is a problem facing a number of teachers of vocational agriculture across the na-

[2] *Doane Agricultural Digest*, Vol. 21, No. 11-5, June 2, 1958, p. 21.

tion. For those boys who can profit from studying vocational agriculture but who have no facilities for carrying out a satisfactory supervised farming program, the group project offers for many a partial solution to their problem. The group project in many schools today is providing a fairly satisfactory supervised farming program for a limited number of town boys. □

Your Agricultural Mechanics Curriculum Can Be Improved!

HARRY O. WALKER, Supervisor of Farm Practice, U. of Calif., Davis

Harry O. Walker

DESPITE good intentions, many instructors of vocational agricultural do not offer programs in agricultural mechanics which meet the needs of today's youth. The retention of outmoded methods and concepts in a new kind of agricultural world has resulted in too many cases in course offerings which are ineffectual. The long-term decline in the ratio of productive jobs to other jobs, and a subsequent increase in occupations involving "service" activities, has not by-passed agriculture. An ever-increasing emphasis on the use of hand and machine tools in both the productive and service areas of agriculture is apparent, yet little concerted action toward updating agricultural mechanics curricula has appeared. Curriculum appraisal and revision, always desirable but of crucial importance in a period of rapid technological advancements, appears to enjoy far less consideration than its importance merits. With the future of vocational agriculture dependent upon satisfaction of student needs, why does this situation exist?

Too frequently the development of a new curriculum involves what Alberty[1] calls the "scissors and paste procedure." This refers to the use of curricula developed for other schools without any serious attempt by the adopting school to determine which features should be retained, which excluded. A second common and equally ineffectual technique is called the "textbook procedure" and involves the development of a curriculum directly from a text appearing to be generally appropriate. While the use of these methods does provide a list of "subjects to be covered," the deficiencies inherent in each are so obvious no additional comment appears necessary. Used as reference materials, these sources can provide information valuable to anyone interested in developing a meaningful shop program. A danger against which the instructor must be constantly alert when using previously developed outlines is that of rationalizing your way into believing that because a subject area has been previously included in a shop program it merits inclusion in the new curriculum.

The consideration due any item can be determined only by a survey and study of the agricultural mechanics needs of the particular community in which you are employed. No other procedure will provide the basic information necessary to develop a really effective shop program. There are no short cuts! This is fortunate, because I believe that the experiences associated with conducting a survey and developing a curriculum from the information thus obtained will prove to be genuinely interesting and, in addition, will develop a degree of confidence in the importance and appropriateness of your work that you do not now possess.

Three questions, submitted for your consideration, may prove helpful in any effort you may direct toward curriculum appraisal and reorganization.

The first question, **Why prepare a curriculum?**, might well be answered, "To enable a teacher to provide instruction of real value to students!"

Recent developments in the physical sciences have created increased interest and concern regarding the quality of the instruction offered in our schools. This is a healthy development, for while present emphasis relates largely to instruction in just a few specific subjects, all areas of education are being scrutinized to determine the extent of their contributions to our total educational effort. As school time becomes more valuable, it is reasonable to expect that greater competition for class time will develop and that elimination of the less productive courses will follow. If this projection of events appears to be reasonable, the need to establish a clear-cut set of objectives and truly functional curricula for all programs of education is apparent. The use of haphazard methods which permit omission of important areas, duplication of others, or the retention of items which are not valuable either to the student or the community, can only result in eventual elimination of ineffectual programs.

Second, **Who should participate in curriculum development?**

Educational advisors, curriculum consultants and administrators at both state and local levels can assist materially with programs of curriculum reorganization. While these individuals cannot be familiar with the educational needs that exist in each community, they can, by virtue of their experience and special training, indicate possible lines of direction, raise questions and suggest issues of importance. The use of local lay advisory groups and individuals is encouraged, but with one caution. It is imperative that all lay participants understand their function in terms of the total objective; i.e., to assist in the development of an effective agricultural mechanics program for your specific community, and that contributions made will be used only as they are compatible with and contribute to this previously selected goal. This is essential, for educational needs as envisioned by adults must inevitably be influenced by their own occupational experiences and requirements. While all of the suggestions offered by participants may be important adjuncts to a shop program, if they are in conflict with the goals of education as envisioned by the school they must not be used.

Third, **What procedure should be followed?**

With your objective established, i.e., to determine the skills from which the agricultural mechanics curriculum in your community should be developed, the procedure used to obtain the information required might follow the outline subsequently indicated. While the sequence is not rigid and may be altered to accommodate local

[1] Harold Alberty, *Reorganizing the High School Curriculum*; New York: Macmillan Co., 1953, page 234.

conditions, all of the elements shown are important and deserving of consideration in any efforts directed toward curriculum development or reorganization.

(1) Read at least one article or text on curriculum development.

Admittedly, this experience will not transform you into a curriculum specialist. It will provide a general background in curriculum organization that will help you to develop an insight into this very important but frequently neglected aspect of our educational efforts.

(2) Present your ideas concerning an appraisal and possible revision of your agricultural mechanics curriculum to your administrator.

You will find him interested and anxious to assist, for the improvements which result will benefit the total school program. However, go prepared for action! Have at least a rough draft of the procedure you believe might be followed to obtain the information desired and which you can submit for his examination. If the assistance of specialists in education outside the immediate school staff is indicated, early in the planning you should obtain administration approval of this procedure so that maximum utilization of the special abilities of these people may be realized.

(3) Decide whom you should contact to obtain the information required.

In developing a list of survey participants, care must be exercised to insure that individuals representing all the various types of agriculture common to the community are included and that proper consideration is given to the relative economic and occupational importance of the agricultural components represented. The use of gross dollar values reported for the various agricultural enterprises should not be used as the sole index of importance, since these figures may not portray the needs or opportunities which actually exist.

The number of people you should include in your survey will be determined largely by the heterogeneity of the agriculture and the time and effort you are willing to expend in the project. Don't establish an arbitrary figure for the number of individuals you will contact but continue your survey until you are satisfied that the data you have is truly representative information which will provide a solid foundation upon which you can develop your curriculum!

(4) Determine the procedure most likely to provide the information required.

Because the development of a questionnaire which provides the information desired is not easily accomplished, most instructors of vocational agriculture will find personal interviews to be the most satisfactory procedure for data gathering. Interviews provide a degree of flexibility which questionnaires cannot possess, for the interviewees may wish to know precisely why the information is desired and how it will be used before they respond. Problems such as response interpretation and the securing of a satisfactory percentage of returns so frequently associated with questionnaires are largely avoided. Too, the teacher-farmer contacts which result permit an exchange of ideas and information which may benefit both parties and assist materially in developing the good public relations so beneficial to a program of vocational agriculture.

(5) Develop an interview form.

It isn't necessary to develop a survey form which includes all areas of possible value to a program in agricultural mechanics. Determine first the major areas which should be considered; i.e., carpentry, welding, machinery repair, tool sharpening, painting, etc. These major groups can be developed by referring to some of the recently published texts on agricultural mechanics and noting the major divisions or chapters included therein. Second, from these same texts and your current agricultural mechanics curriculum, develop a list of the "supporting skills" to be included under each of the major groups. To this, add those skills which have not thus far been included but which you believe to be important to the agriculture in your community. Don't be unduly concerned that deficiencies may exist in your "tentative curriculum." The interviews will serve to identify both the relative importance of the skills included in the survey form and those items which have been omitted but which the farmers and ranchers deem useful in their operations.

(6) Interview the participants.

Despite the danger of pointing out the obvious, it should be emphasized that on the careful selection of participants hinges the success of your data gathering efforts. The individuals chosen should be successful in their respective occupations, interested in education, and willing to provide the information desired. In conducting the interviews, an explanation of the purpose and importance of the survey and the intended use of the contributions made by each person is essential. It is important that the interviews be scheduled for periods when you will not be compelled to compete for the interviewees' time and attention. Don't terminate your interview with the completion of the prepared form. Some of the most valuable information will be acquired by listening to the undirected comments expressed by the participants after the formal survey has been completed.

(7) Develop your farm shop curriculum.

The data acquired will not be as meaningless a mass of information as you might imagine. The interviews will provide a general indication of the relative value of the areas considered, and the summary of the information you develop will furnish a measurable index of skills area importance which can be used to determine the emphasis, in hours of class instruction, to be accorded the various components of the shop curriculum. You will very likely be confronted with the problem of deciding whether you should offer instruction in specialized skills such as hardfacing, field adjustment of diesel injectors, and other semi-technical operations. While the importance of these skills is apparent, when examined in terms of frequency of actual use you may well conclude that student needs in items such as these may be best satisfied by individual instruction or by group demonstrations sponsored by professional organizations in the community. Since you are not in a position to teach all the skills valuable to all members of the community, select first those items which appear to provide the greatest good for the largest number of people.

Regardless of your feelings concerning the adequacy of your present agricultural mechanics curriculum, examine it carefully (and objectively) in light of the suggestions offered. It is my opinion that you will find that some reorganization of your shop program is indicated. But don't just sit there; do something! You will find the total process genuinely interesting and highly profitable. And you can start by reading one of the curriculum references listed with this article!

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Featherstone, William B. *A Functional Curriculum for Youth*. New York, American Book Co., 1950. 276 pp.

Krug, Edward A., *Curriculum Planning*. New York, Harper & Bros., 1950. 306 pp.

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A Dynamic Farm Mechanics Curriculum

For a changing agriculture

ROBERT M. LONGHURST, Graduate Student, Utah State University

To bring out the need for continuous re-evaluation of the farm mechanics curriculum, let us pause to consider the vast technological developments in recent years. Last year (1958) the United States Department of Agriculture survey revealed that farmers would spend eight billion dollars on tools and equipment. Most of this money was for the purchase of new or used machinery, trucks, and automobiles. The average estimated cost per farm was $1700.

The output per man has doubled between 1940 and 1956 because of adopted power units, specialized harvesting machines, and all kinds of chore equipment. Since 1945, the number of new work-saving machines has increased 1,200 per cent. Most of these machines were not in existence in 1938. Tractors have tripled in numbers from 1938 to 1958. Today, we have an average of one and one-half tractors per farm in the United States. The use of all machinery has increased about 300 per cent in the last 20 years.

Farm Production Increasing

Due to the many innovations, farm production has increased, since 1938, 4.7 per cent annually, while the rest of the economy has only increased 2.2 per cent annually. Improved technology has caused this increase and has made the farm support program a failure and a scandal.

The average farm size has increased 40 per cent between 1940 and 1957 while the investment per farm worker increased five times or about $27,000. The value of land alone has increased 42 per cent since 1950.

The increased productivity per man has changed rapidly over the years. In 1940, a farmer could feed himself and 10 others. In 1957, he could feed himself and 21 others and it is expected that a farmer will soon be able to feed himself and 42 others.

Teacher training institutions should meet this challenge in preparing prospective vocational agriculture teachers. Constant re-evaluation of the farm mechanics program is needed in order to keep abreast of progress in farm mechanics.

Trends Shown by Studies

Some of the trends brought out by various studies conducted across the country show the need for a dynamic farm mechanics curriculum.

The job done by teachers reflects favorably or unfavorably on the institution. It was found that: 1. General courses, including general education courses, were much too general and of little value. 2. Impractical courses were being taught with too much duplication. 3. There had not been enough free choice of subjects to meet the needs of the individual. 4. The basic courses should be correlated and integrated with methods courses, also upper division courses.

The technical agriculture courses were rated most important, with training in machinery maintenance, repair and adjustment at the top of the list. This is due to the rapid advances in technology in recent years.

Training in the use of electricity and electric motors was considered a vital part of the farm mechanics training. Labor saving devices using electricity have increased tremendously in the past fifteen years. The construction of buildings has also received a great deal of emphasis. The need for more emphasis on these courses in the farm mechanics curriculum seems quite evident.

In some institutions there has been a trend in recent years to teach more skills and less project work. Several studies have recommended more project work as this type of learning is more practical and realistic. Projects should be of adequate size and scope to meet this criteria.

It is recommended that managerial ability receive greater consideration in the course of study. Management is probably the most important factor necessary for profitable farming. Over mechanization is a serious problem on many farms and economic use of equipment makes the difference between profit and loss. The instruction in "learning by doing" is based on the real life situation which will involve the student. This will bring about self-activity by the student. The instruction should emphasize the practical or a transition from practice to practical.

The most important phase of the pre-service training was the practice teaching period. Several studies felt this training was a crucial part of the over-all curriculum. The average practice teaching period was 10.4 weeks with as much as twenty weeks recommended in one study. It was recommended that a summer session of ten weeks to acquaint the trainee with the summer program and the beginning of school in the fall be included in the curriculum.

In-service training is essential to keep current with modern advances in mechanization and to obtain further preparation and development. Better in-service training was recommended with major emphasis on the small conference and workshop at the local level. The small group technique, with teacher participation and exchange of ideas concerning problems of local importance, was very successful. There should be several seasonally and timely small group conferences each year.

The importance of leadership and planning of the farm mechanics curriculum cannot be over emphasized. Co-ordination and integration of the various phases of this program is essential for effective learning. Plans and programs of training with goals are essential for progress. Planning by administrators and heads of departments within institutions as well as between institutions will help establish more valid objectives.

The administrators at Utah State University are attempting to keep its farm mechanics curriculum dynamic by continuous re-evaluation. Recent changes in the curriculum have improved the pre-service training a great deal. The report, "State Super-

visor's Survey on Pre-Service Training Certification Requirements for Farm Mechanics," from the Pacific Region Conference of Agricultural Engineering and Vocational Agriculture Educators of 1958, showed that Utah State University had a comparatively well constructed curriculum in farm mechanics. □

Relation of High School Vocational Agriculture to Mechanical Farm Jobs Performed by Graduates

W. F. BEAR, Agr. Eng. Dept., Iowa State University

Forrest Bear

CAN you justify the request for a well equipped farm shop to be used in your vocational agriculture instructional program? What returns would you expect as a result of your farm mechanics program?

The enthusiastic farm shop instructor would like to point to several measures of the "fruit of his labor." His students have large, heated shops on their farms which are well equipped with tools. The students also have a high completion rate for the approved farm mechanics practices.

Securing partial answers to the above mentioned questions was the basis of a masters thesis study recently completed at Iowa State University[1].

Forty-five schools, from the eastern livestock or central cash grain farming areas of Iowa, that had offered vocational agriculture during 11 of the 12 years from 1943 through 1954 were paired with schools that had not offered vocational agriculture during the same period of time. Graduates selected from these schools were classed as farm operators in 1955. To be classed as a farm operator, the graduate must have spent 50 per cent or more of his time and received 50 per cent or more of his income from the farm. The 120 graduates selected were stratified according to type of high school training, time of high school graduation, farm ownership status of parents and size of the home farm. Farm size classifications were as follows: small, 0 to 160 acres; medium, 161 to 320 acres; and large, 321 acres or more. Data for this study, one of a series of studies financed by the Iowa Agricultural Experiment Station Project 1253, were collected by personal interviews in 1956.

[1] Bear, William Forrest. Relation of high school vocational agriculture to mechanical farm jobs performed by graduates. Unpublished M. S. Thesis. Iowa State University of Science and Technology Library. Ames, Iowa. 1959.

Farm Shops

There were shops on 113 of the 120 farms. Ninety-seven per cent of the vocational agriculture graduates, as compared to 92 per cent of the nonvocational agriculture graduates, had shops. Smaller differences in total shop numbers existed between graduates in land ownership status of the parents and period of graduation groups. The presence of farm shops was independent of the size of home farm.

Twenty-seven per cent, or 32, of the 113 shops were heated. There were no significant relationships concerning the presence of heated shops on the graduates' farms regardless of the groups compared; however, a higher percentage of the graduates in the large home farm group had heated shops than did graduates in the other farm size groups.

The repair and service of machinery is considered by many as a profitable way to utilize the peak-season labor supply in the off-seasons. This would necessitate a shop large enough in area to work on a car or tractor. As reported by the graduates, seventy-five per cent of the 113 shops were of sufficient size for working on a car or tractor. Small differences in shop sizes were found between the groups according to the stratifications designated in this study.

Shop Tools

There were 16 items of tools or equipment selected for this study. The number of tools and percentages owned by graduates are listed in Table 1. The less expensive tools are more frequently owned than the more expensive. Vocational agriculture graduates owned a greater percentage of 10 of the 16 tools.

Vocational agriculture graduates owned 51 per cent of the 715 tools in the study whereas nonvocational agriculture graduates owned 49 per cent. On an average, vocational agriculture graduates owned 6.1 tools per individual compared to 5.8 tools per nonvocational agriculture graduate. Graduates with heated shops owned a greater percentage of all 16 tools than did graduates with unheated shops. On an average, 54 per cent of the graduates with heated shops had the tools listed compared to 33 per cent of the graduates with unheated shops.

Nine of the 16 tools were more frequently found in the large shops, six of the 16 tools were more frequently found in the medium-sized shops, and only one tool was found more often in the small shops. There did not appear to be a relationship

Table 1. Shop Tool Ownership

Tools	*Percentage of Graduates Owning the Tools*			
	Vocational Agriculture	*Nonvocational Agriculture*	*Heated Shops*	*Unheated Shops*
Machinist's vise	87	80	97	83
Portable electric drill	77	65	81	70
Electric bench grinder	75	65	91	62
Air compressor	48	62	72	53
Blow torch	52	47	75	40
Pipe vise	48	30	63	33
Tap and die set	40	38	59	33
Drill press	28	38	63	23
Portable electric circular hand saw	27	38	53	27
Paint sprayer	33	32	50	28
Electric arc welder	27	17	38	17
Woodworking vise	18	17	34	12
Pipe cutter and threader	17	18	34	12
Portable cement mixer	18	17	22	17
Electric heavy duty grinder	15	15	28	11
Oxy-acetylene welder	00	3	00	3

between a specific kind or size of tool and size of shop.

A correlation between total gross product and number of tools owned by vocational agriculture graduates was computed and the results approached significance at the five per cent level.

Farm Mechanics Jobs

Farm mechanics jobs completed were divided into the following areas; (a) power and machinery, (b) buildings and conveniences, (c) soil and water management, (d) rural electrification, and (e) farm shopwork. The tools listed in the survey were primarily power tools instead of hand tools. There was not, in most cases, any relationship between the tools and the farm mechanics jobs listed in the farm mechanics areas. It was assumed that graduates who had the largest number of tools listed would also be the graduates who had the interest and ability to perform more of the farm mechanics jobs listed in the survey. This was found to be true because in each farm mechanics area the average number of farm mechanics jobs performed increased as the number of tools owned increased.

When considering all of the farm mechanics jobs, the vocational agriculture graduates had higher average completion scores than did the nonvocational agriculture graduates for 28 of the 42 jobs. The owner group had higher scores than did the nonowner group for 35 of the 42 jobs. The 1949-1954 group had higher average scores than the 1943-1948 group for 25 of the 42 jobs.

Graduates with large shops had a higher completion percentage for three of the five areas, whereas graduates with medium-sized shops had the highest completion percentage for the other two areas. There was a tendency for graduates to perform a higher percentage of the farm mechanics jobs as size of shop increased.

Disregarding shop facilities, 67 per cent of the graduates had completed power and machinery jobs, 49 per cent had completed building and convenience jobs, 46 per cent had completed farm shopwork jobs, 37 per cent had completed rural electrification jobs, and 26 per cent had completed soil and water management jobs.

Graduates with heated shops had higher completion percentages than did graduates with unheated shops for 35 of the 42 farm mechanics jobs. Many of the farm mechanics jobs were not dependent upon a shop or heat in the shop for their performance; however, the graduates with heated shops may have had the interest and ability to perform the jobs.

A larger percentage of the graduates with heated shops were in the higher total gross product groups; however, when treated statistically by chi square, there were no significant relationships between total gross product and heated or unheated shops.

It could be assumed that as total gross product increased the size of shop would increase; however, when treated statistically by analysis of variance, there were no significant relationships.

The vocational agriculture graduates completed a higher average number of the farm mechanics jobs than did the nonvocational agriculture graduates in four of the six total gross product groups.

Under the present instructional plan, approximately one-fourth of the vocational agriculture program of study in Iowa is directed to farm mechanics. Assuming that the present division of study time in Iowa is sound and just, any changes in farm mechanics must be made in the instructional area. The quality of instruction in the farm mechanics area may improve when better shop facilities are available; when the prospective teacher receives more adequate preparation at the college level; when in-service assistance in the form of blueprints, shop teaching ideas and lesson teaching materials are made available; when the teacher receives on-the-job assistance; and when on- or off-campus training programs are made available to inform the teacher of new methods and materials. This will not, however, necessarily guarantee a more successful farm mechanics program. The teacher must be interested in farm mechanics, must prepare and plan for the class, and must initiate a sound evaluation and follow-up program.

The future farm owner or operator has a large investment in machinery, buildings and equipment. This investment warrants top quality instruction in farm mechanics and proper emphasis in the vocational agriculture teaching program. □

Suggested Helps in Planning Your Agricultural Mechanics Demonstrations

FRED G. LECHNER, Asst. Prof. in Agr. Engineering, Cornell University

Fred G. Lechner

THE use of demonstrations as a technique in teaching agricultural mechanics to high school vocational agriculture students is, in varying degrees, a well established practice. It is recognized that many techniques or combinations of them may be employed in using a demonstration successfully. This is desirable. Also much has been written about all aspects of using the demonstration as a teaching technique. With the above mentioned facts in mind, then, it is not the purpose of this article to discuss the details in presenting a demonstration. Nor is it the purpose to specify certain prescribed procedures in planning. Rather, it is the purpose to offer ideas which, it is hoped, will stimulate the Vo-Ag teacher to do some creative thinking when planning his manipulative skill demonstrations for the teaching of agricultural mechanics in high school. For both the beginning and experienced teacher there is satisfaction to be gained in doing a better job with the use of the demonstration as a teaching technique. The first step is better planning.

Several factors are involved in planning. They are the following: 1. Objective(s) for the job or skill to be taught; 2. Situations attending the students relative to the teaching of the job or skill; 3. The teaching technique(s) to be used in motivating the students and teaching the job or

skill; 4. Related information needed for adequate understanding of the job or skill to be taught; 5. The actual step-to-step procedure to be used in performing the job or skill; 6. The safety instruction needed; and 7. The kind of student laboratory practice to follow the demonstration.

Objectives

Objectives define the scope and content of the demonstration. The needs of the students help to determine the objectives which should be kept in mind by the teacher. Since the time element in teaching is usually a limiting factor, it is very important to aim the instruction for most desired results. A few minutes of thought in singling out the most essential objective(s) which can be met in the time allotted will help enable the teacher to make the most effective use of his teaching time. Some nice-to-include objectives may need to be eliminated. Certainly it would be a sad situation to teach well a job or skill only to discover that no real, meaningful objective exists. The objective(s) for teaching should relate to the student's need for instruction. When the teaching of a job or skill can be well justified, then meaningful objectives evolve which, when met, will result in meaningful teaching.

Situations

The situations of the students relative to their present degree of understanding and of skill attainment will have an effect on the kind of teaching needed to meet the objective(s). Instruction must begin on a level which the student can comprehend. Then too, a class of students which has some understanding and skill attainment for a particular job or skill may not respond with keen interest to beginning kinds of instruction. Rather, they may profit best by a quick reveiw leading into instruction which is advanced for them. In selecting the key situations, the students' need for the instruction should also be carefully considered.

Teaching Techniques

A list of teaching techniques which may be used with success may be as long as sound creative thinking will permit. Actually, this is desirable for at least two reasons. One, a teacher may succeed well with a technique which he selects, whereas, another may be able to perform equally as well using another technique. Probably no job can be thought of which can only be done correctly with one specific method. Two, the use of a variety of teaching techniques helps not only to maintain student interest, but it also helps to keep the teacher enthusiastic in his teaching. Probably all will agree that a highly enthusiastic teacher has a better chance of succeeding.

To illustrate the use of a variety of teaching techniques in presenting a demonstration several suggestions are briefly discussed.

1. *Teacher to present demonstration.* This method is probably the one most often used. With its use, a given amount of information can be presented in a minimum amount of time. The teaching job, however, may not always be done most effectively this way. The teacher needs to be on guard that he does not assume too much regarding student understanding. Also he may unconsciously develop the tendency to be primarily concerned about his own ability to perform the job to perfection. He needs to be careful that the demonstration does not become merely a "show" rather than a "teaching technique." Nevertheless, this technique, properly used and followed by student practice, will enhance the student's learning process.

2. *Teacher and one or two students demonstrate.* Other students' interest is stimulated when one or two of their fellow classmates will accept a challenge to present, at least in part, a demonstration and, subsequently, will subject themselves to friendly constructive criticism regarding their performance. Also, the fact that one or two students can perform parts, or all, of a job, even though it is done under teacher guidance, generates the confidence of the others. They, too, are immediately ready to tackle the job. To use this method, more teaching time must perhaps be allotted. This factor must be balanced against the very good possibility of doing a more effective job of teaching some jobs or skills. The teacher should, of course, select only students who do know how to perform that portion of the job or skill they are to demonstrate.

3. *Skilled students demonstrate to those who have not yet learned.* This technique serves two purposes. One, it saves teacher time for other instruction which he needs to give. Two, it provides an opportunity for the student who does the demonstrating to learn, still better, the skill involved. In using this method the teacher must, of course, be certain that the students receiving the demonstration have respect for the one presenting it. Also, to maintain good student morale, the opportunity to present a demonstration should be rotated among the members of the class as much as learned experience will permit.

4. *Students try the job followed by as much demonstration as is needed by the teacher.* It is recognized that this method will probably not be used extensively. Occasionally in a class of students there are those who feel so confident they can perform a job or skill that they are not ready to observe closely the teacher's demonstration. Their attention, therefore, is not conducive to effective learning. By the use of the proper psychological approach, this kind of student could be asked to perform the skill without his first observing a demonstration. If he can, with proper attitude both on his and the teacher's part, recognize his own shortcomings after this trial performance, then he will be ready to give proper attention to further instruction.

Related Information

Practically every job or skill, even though it may require mostly manipulative kinds of practice, has related to it some information which, if properly understood, will enhance its correct usage. For an example, to illustrate the point, the job of bronze welding a broken cast iron piece is selected. The step-to-step procedure in performing the job is, of course, very important; however, several facts may be better taught when they are singled out of the step-to-step performance procedure. In the case of the job selected, the student needs to understand: (1) The selection of the correct flux; (2) The selection of the type and size of bronze rod to use; (3) The weldability of the cast iron piece; (4) The practicability of welding the piece in question; and (5) Other possible ways of welding the piece.

The job selected surely is not properly taught without instruction in the five related facts listed above. It is difficult to think of any manipulative job or skill which does not have at least one fact of information related to its proper usage. Adequate student understanding of this related

information will, in all probability, speed up the learning process. In planning for demonstrations, then, the related information to be taught needs to be included. The creative-minded teacher will stimulate student interest by using a variety of methods.

Step-to-Step Procedure in Performing a Job or Skill

Essential to every demonstration is the step-to-step procedure in performing the job or skill. To insure that no wasteful and unnecessary steps are included and, of equal importance, so no essential steps are left out, this phase of the demonstration must be well planned. Also, the plans should remind the teacher what tools and materials he should have readily at hand for the demonstration.

The desired effectiveness may be lost when the person giving the demonstration overlooks a point and has to insert it later. A trial run before the demonstration is presented to the students is usually time well spent. Even the well-experienced teacher will often find that he can do a better job of teaching by following such a plan.

Safety Instruction

Safety instruction related to the performance of a job or skill is of primary importance. The best trained operator is no better than his desire to be safety conscious. If because of his carelessness he is incapacitated, his skill training will, obviously, be of little or no value. Every new job or skill may be a new source of danger for even the most safety conscious student when he does not recognize the safety hazards involved. The teacher must be sure the student has, through instruction, acquired the understanding needed regarding his own safety in performing the manipulative skill he is to learn. In planning for a demonstration, the teacher must be conscious of the safety of his students.

Student Laboratory Practice

The old adage that practice makes perfect is still as true today as it ever was. The job of planning for a demonstration is not complete without providing for the desirable amount of student practice in the laboratory. In planning, two facts stand out over all others in importance. One, the student who is to learn needs to have the opportunity for the amount of practice which will enable him to perform reasonably well the job or skill to be learned. Only relatively very few manipulative jobs or skills can be learned by the discussion and observation technique only. An easy tendency is to ignore sufficient student follow-up with practice. A teacher may find it easier to discuss and demonstrate than to make certain that each student who has had the opportunity to practice has used his time to best advantage to develop his proficiency in the manipulative job or skill to be learned.

Two, practice without proper instruction in related information, safety, and the step-to-step procedure for performing a job or skill may materially hinder the learning process. Desirable traits will likely not be learned. Just sending the boy to shop could, very likely, block his progress in manipulative skill training in agricultural mechanics as much as no training in school at all. This kind of class disorganization could actually provide a means for the student to formally learn undesirable habits in skill performance and in discipline.

Teaching manipulative skills is not an easy job. Contrary to the belief of many, a shop teacher has more planning to do than any other teacher when he does his job comparably as well. More joyful satisfaction will be the result when an agricultural mechanics teacher lifts himself out of the state of inadequacy and confusion into a well-planned orderly procedure in his teaching. □

A current issue - - -

Is Agricultural Education Necessary?

JOE P. BAIL, Teacher Education, Cornell University

Joe P. Bail

THE question is frequently raised today as to the necessity for education in agriculture. These doubts are not confined to programs in agriculture in the public schools alone but include institutions of higher learning offering instruction in agriculture.

These doubts are evidenced by questions and statements such as the following: We have great surpluses of food—why add to the problem by increasing production? We are no longer an agrarian society—why train workers in agriculture? Today's need is for scientists and engineers in our modern industralized society. Agriculture is on its way out—why spend great sums of money on a dying industry? We hear of Agri-Business, Agri-Dynamics, and the "Farmers in a Business Suit." Should we then do away with all instruction in agriculture and concentrate upon science, business, and the other areas which are "Taking over"?

Before we attempt to answer these questions, let's take a look at the various educational programs in agriculture. Although the pattern varies some within each state, basically the programs are as follows:

1. Agricultural Education of Less than College Level—This program, generally referred to as vocational agriculture in our public schools, received its impetus and support from the Smith-Hughes Act of 1917. Designed basically to train present and prospective farmers for proficiency in farming, the program also has many other objectives.* These include the development of effective ability to:

(a) Make a beginning advance in farming.
(b) Produce farm commodities efficiently.
(c) Market farm products advantageously.
(d) Conserve soil and other natural resources.
(e) Manage a farm business effectively.
(f) Maintain a favorable environment.
(g) Participate in rural leadership activities.

Classes with high school students, young farmers, and adult farmers have been organized to carry out these objectives.

2. Agricultural Education on the Technical or Junior College Level—Many states have developed programs to meet the needs of students interested in post-high school training in agricultural and related occupations requiring such specialized training. Ostensibly, these programs have de-

*Monograph No. 21, Vocational Division, Office of Education, U. S. Department of Health, Education, and Welfare. Rev. 1955.

veloped as an outgrowth of expressed needs on the part of young people for training to enter the many occupations associated with agriculture and farming.

3. Agricultural Education on the College Level—The Land-Grant institutions have been delegated the responsibility (with some exceptions—private or other state educational institutions may also grant such degrees) for providing college-level training in agriculture. This training may encompass all of the generally accepted areas of agriculture plus many other sciences closely allied to agriculture. Graduates are prepared for the many professional, semi-professional, and managerial occupations in agriculture as well as farming.

4. Agricultural Education for the General Public—The passage of the Smith-Lever Act of 1914 provided for cooperative extension work with youth, adults, and homemakers. The work of the county agent, the home demonstration agent, and the 4-H Club agent are familiar to most of our citizenry. The "Extension Service," as it is popularly known, is the educational arm of the U. S. Department of Agriculture and the state colleges of agriculture.

As citizens and taxpayers, we have the right and the responsibility to question any or all of these programs. Are they necessary? Is there duplication of effort? Can they be improved? None of us would argue with this basic concept of democracy. Yet, we in the various fields of agricultural education must be prepared to answer these questions put to us. And surely, if our programs are to continue, we must also be prepared to receive constructive criticism and make necessary changes.

Is agricultural education necessary? We in agricultural education would answer with a resounding *YES* for the following reasons:

1. Our agricultural production must be maintained and, yes, even increased in keeping with population growth.

2. Improvements and advances in agriculture must continually take place or the problems of diseases, insects, etc., would soon cut great inroads into our agricultural production.

3. Advancements in agriculture will continue to release workers in this area for other productive jobs or services in our growing economy.

4. Advancements in agriculture have implications for many other aspects of our society. Just as scientific advancements affect agriculture, so do agricultural advances affect science.

5. Even with over-production, some of our population still exists on a substandard basis. Problems of marketing and distribution, are still with us.

6. Until the scientists are able to produce food from the sun or some other source, it will still be fashionable to eat. Therefore, we are all closely tied to the land. When agriculture decays, the history of most nations shows a decline. The land and its resources are our heritage. Let's keep it that way.

Constructive criticism? Yes! Improvements? Yes! These are needed in any program. Let's be prepared to make the changes and modifications necessary to keep our programs active, productive, and of service to the nation. The responsibility is ours as agricultural educators, in cooperation with the general public. Let's chart a course which will keep agriculture strong and keep our nation healthy.

I am proud to be in agricultural education. Are *you*? □

Study identifies - - -

Areas of Instruction Needed by Young Farmers

JACK H. SATORIUS, Vo-Ag Instructor, Brimfield, Ill.

A study of the young farmers in the Garnavillo and Colesburg, Iowa, communities was made by the writer to compare the needs and interests of the young farmers in a community that had not offered young farmer instruction with those of young farmers who had several years of out-of-school meetings. I also tried to determine the areas of instruction needed most by these young farmers.

Jack H. Satorius

The survey blanks provided a place for the young farmers, 14 to 25 years of age inclusive, to express their interests in certain activities typical of a young farmer program as well as to answer various types of factual information questions.

Findings showed no significant differences between the young farmers in the two communities in their ages, years of schooling completed, participation in 4-H clubs, number of brothers, proportion of married to single persons, status in farming, vocational plans, interest in making more money from a certain crop or livestock enterprise, interest in managing the farm business more efficiently, interest in becoming established or better established in farming, interest in becoming established in some occupation other than farming, interest in farm mechanics activities, interest in more opportunities for social, recreational and hobby activities, or in the proportion of veterans to nonveterans.

There were apparent differences between the young farmers of the two communities in the number of young farmers that had participated in FFA chapter activities, that had attended young farmer classes, that were interested in attending young farmer classes and in the number of organizations to which they belonged. In each of these classifications, the young farmers who had attended young farmer classes had a significantly higher degree of participation or interest than did the young farmers who had not attended the young farmer classes.

When the young farmers in the two communities were combined and classified on marital status, I found that the married young farmers had a significantly higher status in farming than the single young farmers. There were no other significant differences based on marital status.

When all of the young farmers were classified on the basis of the number of years of vocational agriculture in high school, I found that those with two or more years of vocational agriculture in high school were significantly more interested in attending young farmer classes than those with less vocational agriculture training. There were no other sig-

nificant differences based on years of vocational agriculture in high school.

When all of the young farmers were classified on the basis of their status in farming, I found that more young farmers in the high status had finished military training, were interested in becoming better established in farming, had participated more in out-of-school classes, and had fewer brothers. Young farmers with a low status in farming were more interested in becoming established in some occupation other than farming and were helping operate larger farms than the young farmers with a high status in farming. All other comparisons based on their status in farming failed to show any significant differences between them.

Incidentally, adequate numbers of young farmers were found in the two communities to justify the beginning or continuation of young farmer classes, even with many of them attending on-farm training classes for veterans.

From this study I found that in planning a young farmer class it would be necessary to consider the following areas of interest to young farmers: (1) crop and livestock enterprises, (2) farm management problems, (3) better establishment in farming, (4) farm mechanics activities, and (5) social, recreational, and hobby activities. Although many young farmers were not interested in other occupations, some attention should be given to them in a young farmer class since all of the young men interested in farming may not be suited to this occupation or be able to become established in farming. □

A suggestion for - - -

Filing Teaching Materials

RALPH H. GRANGER, Assoc. Prof. of Poultry Science,
University of New Hampshire

Teaching plans, procedures and materials are a requirement for good teaching. While a student in teacher preparation, I learned to make the "Job Outline" and something about the reference material to accompany it. However, it was not until teaching in a department alone that a realization of the importance of organization developed. Have you ever been in the position of knowing that you had certain outlines and materials but couldn't find them in time for class? Or have you found at inventory time charts and bulletins and perhaps equipment ordered last summer that you had forgotten existed? You don't have to answer that question, but I'll plead guilty.

The Manila folder has been of primary service in organizing my teaching plans and materials. All lessons, demonstrations, and much printed material are kept in these folders. The "jobs" or teaching units are broken down into relatively small headings and a folder labelled for each. Since a standard Manila folder is creased to expand to an inch thickness of contents, it is possible to collect a considerable quantity of material. By the time the folder has reached its capacity, it is time to subdivide the title or more likely discard a lot of antiquated material.

To illustrate, take the subject of "Brooding Chickens." In the file is a folder marked "Brooding Requirements" followed by a separate folder for each type of brooding device common in this area, i.e., "Electric Brooders," "Hot Water Systems," etc. Each folder typically contains an outline of the procedure used in conducting the lesson followed by references such as bulletins on the subject, pictures and clippings from magazines, and any other pertinent material that I find from time to time.

Another advantage of this system is that it provides a readily available place to put any items as they are discovered—a place where they can be found again readily. But the biggest service is that all the material is in one place when it comes time to prepare tomorrow's lesson or head for class.

Each teacher must develop methods of his own. This system has served me well for 16 years. It might merit your consideration. □

A strong vote for - - -

Developing a School Farm

JOHN BRYANT, Vo-Ag Instructor, Dexter, Missouri

Considerable interest has been given to school farms in the last few years as an important step in the instruction of vocational agriculture. I think that it helps me to make my program more practical and should help all teachers to keep up with the changing agriculture. Our problems are like those of the boys and farmers, so I can appreciate their difficulties.

Before starting a school farm, a teacher should answer a few questions. They are:

1. Will the farmers in your community let your department use their farm for field trips?
2. What are the purposes of the farm?
3. Are you willing to devote some labor and managerial effort of your own?
4. Are your boys enthusiastic about the possibilities of a school farm?
5. Is financing a problem for your chapter activities?
6. Are the school officials willing for such an operation to be developed?
7. Will the parents support such a program, and will they allow occasional use of their machinery?

When I talk of a school farm, I mean one that is large enough to raise most of the common crops grown in the community and to raise some live stock. Such an operation can be educational as well as a money-making project.

The Dexter school farm consists of 140 acres: seventy of pasture, thirty acres of corn, ten acres of soybeans, and thirty acres of wheat. We also have one-half interest in forty-three head of beef calves. The other one-half is under Doane Agricultural Service Management. For the last two years we have had a corn variety test that has added interest to the operation. We have been able to dehorn, castrate, worm, and give hormone implants to the calves during class time to give experience to the boys.

This year the chapter is using farm machinery obtained through the local International dealer. This is a plan for schools. We pay 10% of the list

OVERHAULING A FARM BUSINESS by A. J. Paulus, Published by Department of Agricultural Education, University of Tennessee, Knoxville, Tennessee, in Cooperation with State Board for Vocational Education, August, 1958, 252 pp. Illustrated.

In the words of the author this booklet is "an attempt to bring together the more important areas of management into the job-problem form." He states further "it should provide considerable help toward placing the teacher in this state in position to teach farm management as well as they are now teaching soils, crops and livestock—units."

The publication, specifically subject Matter Mimeo No. 28, is one of a continuing series of mimeos prepared in the Department of Agricultural Education at the University of Tennessee. Admittedly prepared for Tennessee teachers, much of the content applies to that state specifically, but many excerpts are from publications from other areas. Teachers in other states should find the organizational approach and much of the subject matter helpful.

The author has organized the materials under 12 job headings or teaching units. The first three units are designed to assist teachers in developing interest and understanding of the farm management problem. The remaining nine units pertain to specific jobs or problems which a farmer must deal with in "overhauling" his farm business. At the beginning of each unit, a number of key questions pertaining to that specific problem are listed. The material, largely a compilation of excerpts from the writings of authorities in the field and factual data, is organized around the questions initially raised.

The lithographed booklet contains 78 tables and 41 figures which fit into the text very well. An extensive bibliography is contained in the appendix. The contents are adequately indexed to facilitate reference. A note of human interest is injected by the inclusion, whereever space permits, of selected bits of poetry, including some of the author's own composition.

Dr. Paulus is professor of agricultural education at the University of Tennessee where for many years he has been responsible for the preparation of subject matter materials.

George L. O'Kelly, Jr.
Teacher Trainer,
University of Ga. □

◀ TIPS THAT WORK ▶

How to Develop a Winning Poultry Judging Team

To train boys to win a judging contest is undoubtedly one goal of all agriculture teachers. At the same time, to instill in the boys the proper attitude, win or lose, is a desirable trait to take out into life. But, getting back to how to train a winning poultry team, the process can be summarized in a few major points, namely:

1. Give the boys a thorough background of judging and culling when studying poultry in class by using live birds, charts, pictures, film strips, slides and films (if available) backed up by practical application on the farm.
2. Intensively review the entire program of poultry judging instruction as outlined in point No. 1 a week or two before the contest.
3. Use the facilities of your area to the maximum advantage by taking the boys to good farms where they can practice judging and "learn by doing."
4. If time is limited, bring the birds and eggs to the classroom for practical work.
5. Have up-to-date materials on hand for the boys to take home and study on their own.
6. Work on the premise that your boys have what it takes, that they have a reputation to uphold, and that they will "bring home the bacon."

This strategy has produced winning poultry teams in the state three out of the last five years I have been teaching at the Millsboro School.

William H. Jenkins,
Vo-Ag Instructor,
Millsboro, Delaware □

Wisconsin Has Eleventh Annual Conference

Programs and plans for vocational agriculture in Wisconsin were discussed recently at the eleventh annual conference of Wisconsin state workers at Cable, Wisconsin.

Present at the conference were: D. C. Aebischer, C. H. Bonsack, M. W. Cooper and L. M. Sasman of the State Board of Vocational and Adult Education; W. T. Bjoraker and G. W. Sledge of the University of Wisconsin; V. E. Nylin of Wisconsin State College at Platteville; R. J. Delorit of Wisconsin State College at River Falls; and high school instructors in agriculture—George John, Mt. Horeb; Donald Schwartz, Platteville; R. C. Wall, River Falls; and W. Hansen, Spring Valley.

Included in the agenda of the two-day conference were discussions of: the revised Wisconsin suggested course of study for vocational agriculture, the farming program record book, in-service teacher training programs, research activities in vocational agriculture, and coordination of the activities of the teacher training institutions.

L. M. Sasman, Chief,
Agricultural Education,
Wisconsin □

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cost for one year. Previously the chapter had owned its equipment.

The boys donate one-half day of time with their tractors or one full day of labor as their part toward the cooperative project. The rest of the work is done by having some of the members drive the chapter tractor.

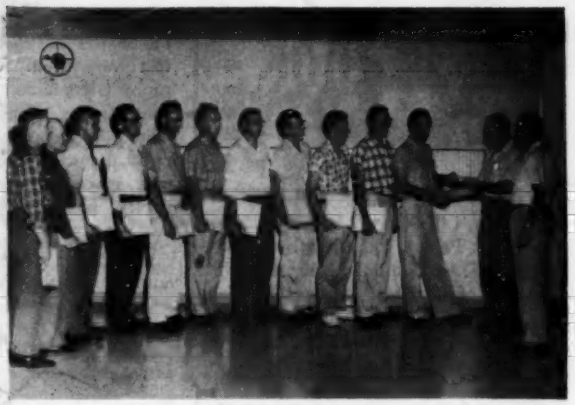
The school farm should not be used as an extensive experimental farm. It should be used as a place to give experience to boys and to carry out the practices recommended by the College of Agriculture.

I don't approve many of the old money-making activities as they are time consuming and involve no learning. The farm is time consuming, but it does provide for learning. It also gives the teacher a chance to meet the farmer on an equal basis.

School farms aren't necessary for all departments, but in our case I think the advantages overshadow the disadvantages. □

Front row: R. J. Delorit, R. C. Wall, Donald Schwartz, L. M. Sasman, D. C. Aebischer, G. W. Sledge, V. E. Nylin
Second row: M. W. Cooper, W. Hansen, C. H. Bonsack, W. T. Bjoraker, G. L. Johnson

Bert Benton, Tolt-Carnation FFA, and his Grand Champion Steer at the North-West Junior Livestock show. The animal was named Champion Hereford over thirty-four other animals and went on to be named Grand Champion in the FFA Division. Bert was also Grand Champion Novice Showman. He is a Sophomore in school and this was the first steer he had raised or exhibited. (R. D. Walen, Carnation, Wash.)



New Vo-Ag instructors in North Dakota receive "My Creed" at the summer conference, Fargo, N. Dakota. Presentation is being made by Charles Challey, Valley City, North Dakota, who framed the Creed for the presentation. Clifford Nygard, President, is assisting. Pictured from left to right are: Ray Telkamp, New Rockford; Arnold Stockstad, Park River; Donald Tumbleson, Milton; William Parker, Fessenden; Lawrence Holt, Mohall; Leo Grubl, Elgin; Howard Pearson, Carson; Kenneth Fuhrman, Velva; James Hanson, McClusky; Clifford Spieker, Crosby; Roland Operstrom, Linton.

STORIES in PICTURES

Seated: Charles Woody (34 yrs.), A. Gorrell (39 yrs.), T. L. Wright (31 yrs.), Guy James (35 yrs.), J. A. Comer (33 yrs.), O. O. White (33 yrs.).
Left to right standing: John Wolfe (38 yrs.), Frank Gillett (35 yrs.), John Kirby (31 yrs.), G. F. Ekstrom (37 yrs.), Frank Smith (35 yrs.), E. E. Schmid (30 yrs.), O. R. Tripp (32 yrs.), Roy Luyster (32 yrs.), K. M. Craghead (30 yrs.), Joe Moore (31 yrs.), Carl Roda (34 yrs.), T. C. Wells (35 yrs.), Floyd Barnhart (34 yrs.), Lester Swaney (32 yrs.).
Absent: C. A. Jackson (32 yrs.)
The men seated retired June 30, 1958.

These teachers of vocational agriculture in Missouri were honored at the annual banquet of the Missouri Vocational Agriculture Teachers Associaiton on June 4, 1958. Each received an engraved gold wrist watch through the Sears Roebuck Foundation. A brochure telling of the teaching experience of each man was developed and several copies presented to them. The wives of these men who attended the banquet were presented with corsages.

A total of 703 years of experience is represented by this group of men. Missouri is proud of their record and accomplishments.

Teachers completing ten years of service to vocational agriculture were presented recognition certificates at the 48th Annual Meeting on June 25th at Cornell University by J. M. Carter, past president of the Association. They are (left to right) Charles Petch, Lester Leavitt, Charles Guzewich, Harold Damour, Durwood, Carman and John Smith. Looking on admiringly from the background is Stanton B. Smith, Association president for 1958-59.

Gettysburg, Ohio, sophomore students of vocational agriculture Ronald Lyme, Lewis Stahl and Don Vanatta are shown overhauling lawnmower and garden tractor motors in farm mechanics. Prior to this instruction their Vo-Ag Teacher, J. D. McComas, attended one of the several in-service training workshops on one cylinder engines, conducted by the State Vocational Agriculture Department.